

A new study from Academia Sinica reveals why some patients clear the SARS-CoV-2 virus faster than others

How does the immune system eradicate SARS-CoV-2-infected cells? Why does the viral clearance rate differ among patients? In a study published in [*Journal of Clinical Investigation*](#), a team led by [Dr. Shih-Yu Chen](#) at the Institute of Biomedical Sciences, Academia Sinica, showed that natural killer (NK) cells are the key immune cells responsible for the rate of SARS-CoV-2 viral clearance. Specific NK subsets were enriched in patients who more rapidly cleared the virus.

Previous research had revealed that virus-specific neutralizing antibodies and T cell responses are essential to control of SARS-CoV-2 infection. However, scientists did not know much about how other immune cells cooperate to fight against the SARS-CoV-2 virus.

The research team led by [Dr. Shih-Yu Chen](#) used cutting-edge technology called mass cytometry to dissect out the relationships between immune cells and the viral clearance rate by analyzing the blood from COVID-19 patients. Interestingly, certain natural killer (NK) subsets appear to be the determining factor in rate of viral clearance.

“Our findings demonstrate that we need to look at NK cells, not just antibodies or T cells, if we want a complete picture of how the immune system reacts to the SARS-CoV-2 infection. In contrast to antibodies and T cells, which recognize viral proteins, NK cells mainly recognize the stress reactions from the virus-infected host cells and respond to them. As frontline responders, NK cells could not only determine how fast the virus is cleared from the patients but also the disease severity,” said Dr. Chen.

Targeting NK cells could be a potential therapeutic approach to eradicate SARS-CoV-2 infection as was tested *in vitro* in the study by Dr. Chen’s research team. The team

is currently working on ways to further boost the NK cell-mediated anti-viral responses and is exploring the roles of NK cells in other clinical settings such as vaccinations, other viral infections, and cancers.

The first author of this paper is Ms. Wan-Chen Hsieh from the Institute of Biomedical Sciences, Academia Sinica. The research team also includes Dr. Yen-Tsung Huang from the Institute of Statistical Science, Dr. Huai-Kuang Tsai from the Institute of Information Science, Dr. Yi-Ling Lin, Dr. Chia-Wei Li, and Dr. Yao-Ming Chang from the Institute of Biomedical Sciences, and Dr. Kuo-I Lin from the Genomics Research Center, all from Academia Sinica, as well as Dr. Hsing-Chen Tsai and Dr. Sui-Yuan Chang from National Taiwan University and Dr. Gerlinde Wernig from Stanford University. The research was funded by Academia Sinica and the Ministry of Science and Technology.

The paper can be read online at:

<https://www.jci.org/articles/view/146408>

